Novel methods for the detection of functional brain activity using 17O MRI

Propositions

According to Article 23 of the regulation governing the attainment of doctoral degrees of Maastricht University a minimum of eight and a maximum of eleven propositions have to be made. Here, the first four are related to the topic of the present thesis, the next four propositions are related to the general research topic, one to the valorisation opportunities and finally one to graduate school programs.

1. If possible, $CMRO_2$ shall be measured non-invasively.
2. Further studies on hybrid imaging devices shall show for the first time quantitative agreement of gold standard PET measurements and MRI-based methods.
3. Any radioactive exposure shall be abandoned.
4. Ultra-high magnetic field strength MRI opens new prospects of studying different nuclei and the various metabolic processes involved; this shall be further investigated.
5. New quantitative imaging methods shall be, if possible, always compared to gold standard methods such as spectroscopic phantom measurements in the case of relaxometry.
6. Researchers in MRI should always adhere to ethical guidelines and to rules of good clinical practice.
7. Principles of good research shall always be followed.
8. Preclinical methods could benefit from small animal imaging modalities, thereby avoiding unnecessary discomfort for patients.
9. New methods for fast, quantitative and non-invasive evaluation of metabolic processes give rise to a better understanding of various diseases, which could lead to a better patient handling and potentially new methods of treatment.
10. More international graduate school programmes such as the Marie Curie Initial Training Network should be established.